

STRAP FASTENER SET

Field of Invention

The present invention relates to a strap fastener set capable of providing a reading of a tensile force exerted thereon.

Background of Invention

A typical strap fastener includes a base, a reel pivotally put on the base, a lever pivotally installed on the reel, two ratchet wheels secured to the reel, a first detent movably installed on the base for engagement with the ratchet wheels and a second detent movably installed on the lever for engagement with the ratchet wheels. In use, a first strap or a first end of a strap is tied to the base. A second strap or a second end of the strap is wound on the reel. The lever is pivoted relative to the base in order to perform a one-way rotation of the reel through cooperation of the detents with the ratchet wheels. The reel winds the first strap or the first end of the strap so as to exert a tensile force on the straps or the strap. The tensile force may however be too large for the straps or the strap to sustain. In such a case, the straps or the strap may be fractured. When that happens, cargo will get loose and become vulnerable to damages. What is worse is that the loose cargo may cause hurt people.

The present invention is therefore intended to obviate or at least alleviate the problems encountered in prior art.

1 **Summary of Invention**

2 It is the primary objective of the present invention to provide a strap
3 fastener set capable of providing a reading of a tensile force exerted
4 thereon.

5
6 According to the present invention, a strap fastener set includes a strap
7 fastener for winding a first strap and a gauge provided between the strap
8 fastener and a second strap. The gauge includes a cylinder tied with the
9 second strap. The cylinder includes a window defined therein and a
10 scale provided thereon along the window. A first ring is secured to the
11 cylinder. A spring is put in the cylinder. A rod extends past the ring
12 through the spring for connection with the strap fastener. A second ring
13 is secured to the rod so that it is moved relative to the cylinder so as to
14 compress the spring against the first ring when a tensile force is exerted
15 on the straps. The second ring includes an indicator formed thereon for
16 cooperation with the scale so as to provide a reading of the tensile force.

17
18 Other objects, advantages and novel features of the invention will become
19 more apparent from the following detailed description when taken in
20 conjunction with the attached drawings.

21
22 **Brief Description of Drawings**

23 The present invention will be described via detailed illustration of the
24 preferred embodiment referring to the attached drawings.

1 Figure 1 is a side view of a truck on which cargo is held by means of
2 straps and strap fastener sets according to the preferred embodiment of
3 the present invention.

4
5 Figure 2 is a perspective view of one of the strap fastener sets shown in
6 Figure 1, showing the strap fastener set to include a strap fastener and a
7 gauge.

8
9 Figure 3 is an exploded view of the gauge shown in Figure 2.

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11 Figure 4 is a top view of the strap fastener set shown in Figure 2.

12
13 Figure 5 is a cross-sectional view of the gauge shown in Figure 4.

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15 Figure 6 is similar to Figure 4 but shows the strap fastener set in a
16 different position.

17
18 Figure 7 is a cross-sectional view of the gauge shown in Figure 6.

19
20 **Detailed Description of Preferred Embodiment**

21 Figure 1 shows a truck 100 on which cargo 101 is held by means of three
22 pairs of straps 3 and three strap fastener sets according to the preferred
23 embodiment of the present invention. Each strap 3 is tied with a hook 4
24 for hooking the truck 100. Each strap fastener set includes a strap
25 fastener 1 connected with one strap 3 of a pair and a gauge 2 tied with the

1 other strap 3 of that pair. The following description will be focused on
2 only one strap fastener set and only one pair of straps 3.

3
4 Referring to Figure 2, the strap fastener 1 includes a base 10, a reel 30
5 pivotally put on the base 10, a lever 20 pivotally installed on the reel 30,
6 two ratchet wheels 31 secured to the reel 30, a first detent 11 movably
7 installed on the base 10 for engagement with the ratchet wheels 31 and a
8 second detent 21 movably installed on the lever 20 for engagement with
9 the ratchet wheels 31. In use, the first strap 3 is wound on the reel 30.
10 The lever 20 is pivoted relative to the base 10 so as to provide a one-way
11 rotation of the reel 30 through cooperation of the detents 11 and 21 with
12 the ratchet wheels 31. The reel 30 winds the first strap 3. Being
13 conventional, the strap fastener 1 will not be described in detail.

14
15 Referring to Figures 2-5, the gauge 2 includes a cylinder 43 with a
16 window 52 in the form of a slot defined therein and a scale 54 formed
17 thereon along the window 52.

18
19 A cap 45 is secured to the cylinder 43 without blocking the window 52.
20 The cap 45 includes a cylinder 56 and an annular flange 58 formed on an
21 internal side of the cylinder 56. The cylinder 56 of the cap 45 may be fit
22 in the cylinder 43. Alternatively, the cylinder 56 of the cap 45 may be
23 secured to the cylinder 43 by welding. In a simplified embodiment, the
24 cap 45 and the cylinder 43 are merged. In other words, the cap 45 is
25 saved while an annular flange such as the annular flange 58 of the cap 45

1 is formed on an internal side of the cylinder 43.

2

3 A spring 47 is put in the cylinder 43. A rod 46 is substantially inserted
4 in the cylinder 43. A first end of the rod 46 is inserted past the annular
5 flange 58 of the cap 45. A ring 48 is put in the cylinder 43 and secured
6 to a second end of the rod 46. In a simplified embodiment, the ring 48
7 and the rod 46 are merged. The spring 47 is compressed between the
8 ring 48 and the annular flange 58 of the cap 45. The ring 48 is provided
9 with an indicator 60 that is observed through the window 52. The
10 indicator 60 cooperates with the scale 54 in order to provide a reading of
11 a tensile force exerted on the gauge 2.

12

13 A ring 44 is secured to the cylinder 43 by means of screwing. A bolt 62
14 is secured to the ring 44. In a simplified embodiment, the ring 44 and
15 the bolt 62 are made as one.

16

17 In a simplified embodiment, the ring 44 and the cylinder 43 are merged.
18 However, it should be noted that only one of the ring 44 and the cap 45 is
19 merged with the cylinder 43.

20

21 The rod 46 of the gauge 2 is connected with the base 10 of the strap
22 fastener 1 by means of a first joint 41. The bolt 62 of the gauge 2 is
23 connected with the second strap 3 by means of a second joint 42.

24 The first joint 41 includes a middle section and two terminal sections
25 extending from the middle section. A bolt 12 is driven into the terminal

1 sections of the first joint 41 through two lateral sections of the base 10,
2 thus pivotally connecting the first joint 41 with the base 10.

3

4 The second joint 42 includes a middle section and two terminal sections
5 extending from the middle section. Into the terminal sections of the
6 second joint 42 is driven a bolt 64 to which the second belt 3 is secured.

7

8 Referring to Figures 6 and 7, subject to a tensile force, the first strap 3 is
9 pulled away from the second strap 3. The spring 47 is compressed
10 between the ring 48 and the annular flange 58 of the cap 45. The ring 48
11 is moved in the cylinder 43. That is, the indicator 60 is moved with
12 respect to the scale 54 in order to provide a reading of the tensile force
13 exerted on the gauge 2.

14

15 The present invention has been described via illustration of the preferred
16 embodiment. The applicant gives the preferred embodiment only as an
17 example, and those skilled in the art can derive variations from the
18 preferred embodiment after a study of this specification. Therefore, the
19 preferred embodiment shall not limit the scope of the present invention
20 that is defined in the following claims.